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RESEARCH ARTICLE

Unexpected finding of rare and little known leaf beetle *Chrysolina levi* (Coleoptera, Chrysomelidae) in West Siberia

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Abstract

The first record of rare and little known leaf beetle *Chrysolina levi* Okhrimenko, 1990 was registered in the Omsk region (West Siberia). Redescription of male is given because holotype was collected dead and damaged, lacking legs, antennae, head and pronotum. Position of *Chrysolina levi* inside subgenus *Chalcoidea* is discussed, its distribution area in Scythian steppe region is now considered as Taman'–Irtysh instead of Pontic.

Keywords

Chrysolina levi, redescription, Omsk region, Siberia

Introduction

The leaf beetle *Chrysolina* (*Chalcoidea*) *levi* Okhrimenko, 1990 was described from Krasnodar province based on one male and one female only. Moreover, both specimens were collected dead at the base of sagebrush plant. Female lacks legs and antennae almost entirely, male also lacks head and pronotum (Okhrimenko 1990). Thus, the holotype and paratype are both remains of beetles with various damage rate. Therefore

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the original description of male holotype is very brief, five lines only, but it provides the figure of aedeagus, whereas the original description of female paratype is more detailed. Later, Bieńkowski (2007) collected one more female in Krasnodar province near Kuchugury village, attributed it to this species and made its redescription.

Thus, *Ch. levi* is the rarest species of *Chrysolina* described by three specimens only, including the types, and no alive male has been collected so far. Authors of the subsequent keys (Bieńkowski 2007; Warchałowski 2010) had to copy the original, quite sketchy aedeagus drawing from the description of Okhrimenko (1990), while the original drawing based on holotype examination was presented recently by Bieńkowski (2019).

Unexpectedly, Roman and Evgeny Dudko collected one male of this species far away from Krasnodar province in 2015. The new locality in Omsk region is 2800 km eastwards and almost 10 degrees northwards from the type locality. Although a very comprehensive review of the leaf beetle fauna has been completed recently for this region (Moseyko et al. 2018), our record herein proved to be the first not only for Omsk region but also for Siberia.

Material and methods

All measurements were made using an ocular grid mounted on MBS-10 stereomicroscope. Total body length (**TL**) was measured from the anterior edge of pronotum to the elytral apex, body width was measured in the broadest part of elytra (**EW**). Redescription is based on the algorithm proposed by Bieńkowski (2011) for species descriptions in the genus *Chrysolina*.

Abbreviations: NOC (Nikolay Okhrimenko personal collection, Krasnodar, Russia); ZIN (Zoological Institute of Russian Academy of Sciences, St.-Petersburg); YMC (Yuri Mikhailov personal collection, Yekaterinburg, Russia).

Results

Chrysolina (*Chalcoidea*) *levi* Okhrimenko, 1990: 64

Previous known localities. RUSSIA • 1♂ (holotype), 1♀ (paratype); Krasnodar Province, Taman' peninsula, env. of Sennoy; 45.274°N, 36.993°E; 25 Jun. 1987; B.A. Korotyaev leg.; sagebrush-cereal steppe (Okhrimenko 1990) – ZIN indicated as official depository but in fact deposited in NOC (Bieńkowski 2019); RUSSIA • 1♀; Krasnodar province, Temryuk district, 10 km NW Kuchugury village, 45.450°N, 36.856 °E; 31 May 1999; S. Lingafelter leg.; on *Linaria genistifolia* (Bieńkowski 2007).

Specimen examined. RUSSIA • 1♂; Omsk region, Cherlak district, 7 km NNW Jartargul village, Sylkin lake shore; 54.448°N, 75.550°E; 26–27 Jul. 2015; R. and E. Dudko leg.; saline land (solonchak); collected at night with torch (YMC).

Redescription of male. Body elongate-ovate, shining, finely shagreened (Fig. 1). **TL** – 6.2 mm, **EW** – 3.7 mm. Dorsum bronze, unicoloured, underside and legs black, with feeble bronze reflex. Antennae, maxillary palpi and tarsi dark brown, antennomeres 1 and 2 beneath and claws rufous.

Head. Frontoclypeus finely and densely punctured; frontal suture slightly impressed, epicranial suture hardly visible. Last maxillary palpomere wide, almost square, straightly truncate, 1.1x longer then broad, 1.4x longer and 1.5x wider than previous palpomere. Relative length of antennomeres 1–3 as ratios 7, 3, 5. Tenth antennomere 1.6x longer than broad, eleventh antennomere – 2.1x. Orbital lines narrow, almost reaching antennal insertion.

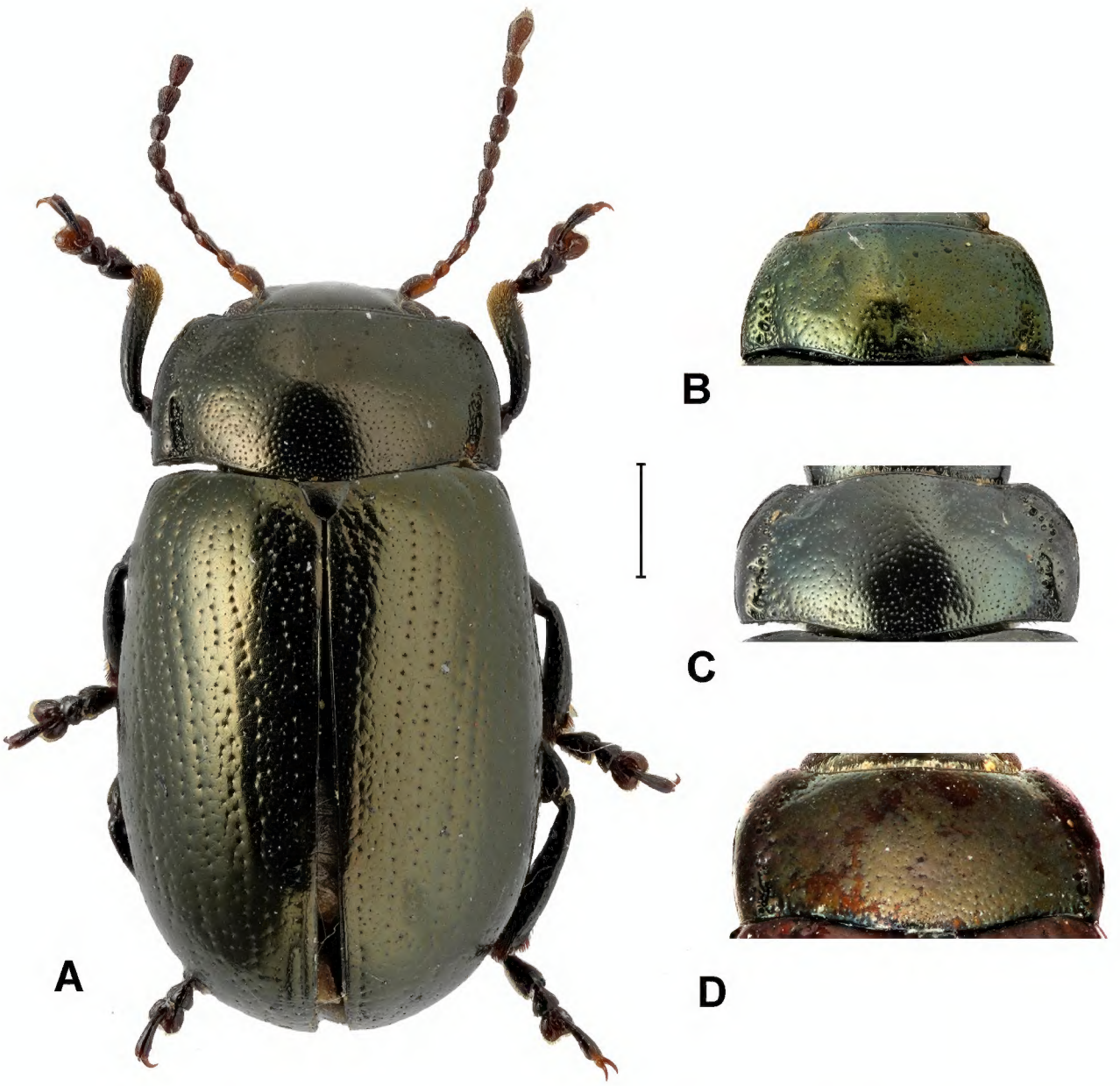

Figure 1. Habitus of *Chrysolina levi* and pronota of *Chalcoidea* other representatives. **A** – Dorsal view of *Ch. levi* (male) **B** – Pronotum of *Ch. marginata finitima* (south of Yamal peninsula) **C** – Pronotum of *Ch. immarginata* (Kyrgyzstan, Sary-Dzhas river valley) **D** – Pronotum of *Ch. dieckmanni* (holotype). Scale 1 mm.

Thorax. Pronotum transverse, almost twice (exactly 1.9x) broader than long, broadest anterior to middle; pronotal disc evenly convex, except for smooth ovate area medially covered with moderately large, dense punctures; sides slightly rounded, in basal half almost parallel-sided and noticeably converging anteriad; width between anterior angles 1.4x less than basal width. Anterior angles moderately produced, rounded triangular; basal angles obtuse, bearing one setiferous pore each; anterior edge margined, with dense setae, widely incised in bracket-shape; basal edge arcuately convex; sides swollen along entire length, lateral ridges very narrow, basally comprising only 1/7 of pronotal width; lateral impressions in basal 1/3 form deep grooves from fused coarse punctures with vertical outer border; anterior part of lateral impressions moderately deep with large and very dense but not coalescent punctures; hypomera slightly convex, with weak wrinkled impression along outer side, basal fold deep; prosternal process with deep longitudinal furrow; anterolateral portion of prosternum narrow, almost flat, with wide, slightly impressed furrow medially; prosternum 1.3x shorter than metasternum; metasternum deeply margined along anterior edge, 1.2x shorter than first ventrite; scutellum triangular, apically rounded, impunctate, 1.1x length.

Elytra. at base slightly wider than pronotum, with weak humeral callus, each elytron 2.3 times longer than wide. **EL** (elytral length) 4.6 mm. Primary puctures large, form rows that are paired starting with 2nd. Puncture rows partly confused, especially rows 6 and 7, row 1 confused where it goes closer to scutellar row, which consist of 9 punctures. Intervals flat, their punctation fine and sparse, with thin wrinkles, but among fine punctures there are also larger ones, almost of the same size as on pronotum. Marginal stria with large dense punctures. Sutural stria distinct at apical slope. Epipleura inclined outside, visible along entire length. Hind wings developed.

Tarsi. moderately broadened, ratio of width of fore tarsomeres 1–3 as 1.0, 1.0, 1.5. All tarsomeres with entire sole beneath.

Abdomen. Pygidium with deep longitudinal furrow at 4/5 of entire length. Ventrite 1 broadly margined on anterior edge, covered with small sparse punctures, only anterior intercoxal process covered with large wrinkled punctures. Last ventrite very slightly convex, with slightly incised apex, medially with flat impunctate area slightly depressed apically.

Aedeagus. (Fig. 2) with broad rounded subtriangular apex, its dorsal surface weakly chitinized, lateral curves very slight. Flagellum thin, but not whip-shaped on the apex, slightly curved, produced from apical orifice for 1/3 of its length.

Discussion

Okhrimenko (1992) treated this species as Pontic, endemic to Eisk-Taman' (or Taman' steppe) natural district. This was true for the findings limited by Taman' peninsula. Now it is clear that *Ch. levi* has wider distribution in West Scythian subre-

gion of Scythian steppe region (according to zoogeographic scheme of Emeljanov 1974). The new record in the extreme south-east of Omsk region is evidenced that this species has Taman'-Irtysh distribution (Fig. 3), considering that the saline lands are also common in the adjacent Novosibirsk region and Kazakhstan, where this species could be found.

Ch. levi was initially placed by Okhrimenko (1990) in the subgenus *Chalcoidea* Motschulsky, 1860, although this species has somewhat isolated position lacking several peculiar subgeneral characters. These characters are narrow last maxillary palpomere, similar in both sexes, aedeagus usually "bottle shaped" with narrow long or short apical projection, reddish lateral stripe on elytra (Bieńkowski 2019). In addition, *Ch. levi* has specific structure of aedeagus and pronotum. Aedeagus shape of *Ch. levi* (Fig. 2) is very peculiar not only among *Chalcoidea* but in the whole genus *Chrysolina*. Lateral impressions of pronotum of this species are deep and narrow (Fig. 1A), while in other representatives of *Chalcoidea* they are usually shallow, basally widened and covered with coarse punctures (Fig. 1B-D).

Okhrimenko (1990) put *Ch. levi* closer to *Ch. hyrcana* Weise, 1884 and *Ch. turgaica* (Jacobson, 1910), thought the latter species has very different aedeagus shape.

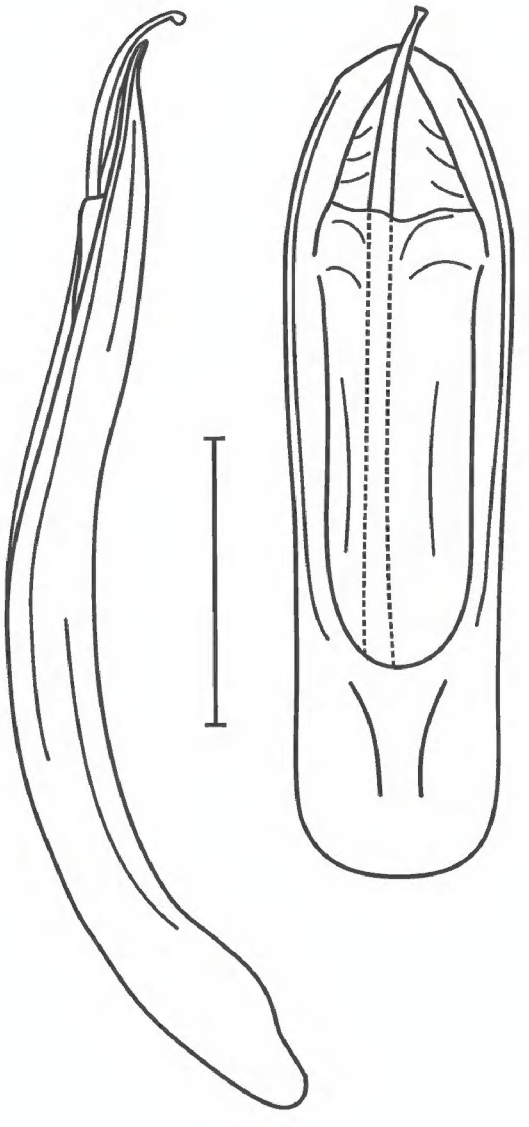

Figure 2. Aedeagus of *Chrysolina levi* laterally and dorsally. Scale 1 mm.

Figure 3. Records of *Chrysolina levi* and boundaries of Scythian steppe region (following Lavrenko et al. 1991).

In *Chalcoidea*, *Ch. levi* can be put closer to *Ch. songarica* Gebler, 1843 (= *Ch. hyrcana*) or to *Ch. immarginata* (Rybakow, 1884) and *Ch. dieckmanni* (Mohr, 1966) due to specific structure of pronotum. These species have narrow lateral ridges of pronotum and relatively narrow lateral impressions, although coarse punctures in these impressions are always separate, not fused like in *Ch. levi*. Peculiar deep furrow-shaped impressions of pronotum provide means to place *Ch. levi* closer to the representatives of the subgenus *Jeanclaudia* Mikhailov, 2009, for example, *Ch. ordinata* Gebler, 1823.

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References

Bieńkowski AO (2007) A monograph of the genus *Chrysolina* Motschulsky, 1860 (Coleoptera, Chrysomelidae) of the world. Part 1. Techpolygraphcentre, Moscow, 417 pp.

Bieńkowski AO (2011). Leaf beetles (Coleoptera, Chrysomelidae) of the European part of Russia. Lambert Academic Publishing, Saarbrucken, 535 pp. [in Russian]

Bieńkowski AO (2019). *Chrysolina* of the world – 2019 (Coleoptera: Chrysomelidae). Taxonomic review. Mukhametov G.V. Publ., Livny, 919 pp.

Emeljanov AF (1974). Proposals on the classification and nomenclature of areals. Entomologicheskoe Obozrenie 53: 497-522. [in Russian]

Lavrenko EM, Karamysheva ZV, Nikulina RI (1991) Steppes of Eurasia / Biological resources and natural conditions of the Mongolian Peoples Republic. V. 35. Nauka, Leningrad, 146 pp. [in Russian]

Moseyko AG, Ponomarev KB, Teploukhov VY, Knyazev SA (2018). A review of the leaf-beetle fauna (Coleoptera, Chrysomelidae sensu lato) of Omsk province. Entomological Review 98: 1064–1087. https://doi.org/10.1134/S0013873818080134

Okhrimenko NV (1990). A new species of the genus *Chrysolina* (Coleoptera, Chrysomelidae) from the West Caucasus. Vestnik Zoologii 5: 64–67 [in Russian, English summary]

Okhrimenko NV (1992). Leaf beetles (Coleoptera, Chrysomelidae) of North-Western Caucasus. PhD Thesis, A.N. Severtzov Institute of evolutionary morphology and ecology of animals, Moscow, 120 pp.

Warchałowski A (2010). The Palaearctic Chrysomelidae: Identification keys. Vol. 1. Natura optima dux Foundation, Warszawa, 629 pp.